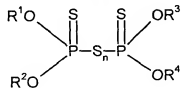


WHAT IS CLAIMED IS:

1. A process for the production of dithiophosphoric acid polysulfide mixtures of the formula



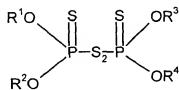
in which

R¹ to R⁴ are identical or different and denote a linear or branched C₁-C₁₈ alkyl residue, C₁-C₁₈ alkenyl residue, C₅-C₂₈ cycloalkyl residue, C₅-C₂₈ cycloalkenyl residue as well as a C₆-C₂₈ aryl residue or C₇-C₂₈ aralkyl residue

and

n denotes a number from 2.5 to 3.5,

comprising the step of reacting dithiophosphoric acid disulfides of the formula

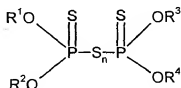


in which

R¹ to R⁴ have the above-stated meaning,

with 0.5 to 1.5 mol of sulfur, optionally in the presence of a solvent, at temperatures of 100 to 140°C.

2. A sulfur donor for the vulcanization of natural and synthetic rubber comprising dithiophosphoric acid polysulfide mixtures of the formula



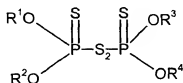
in which

R¹ to R⁴ are identical or different and denote a linear or branched C₁-C₁₈ alkyl residue, C₁-C₁₈ alkenyl residue, C₃-C₂₈ cycloalkyl residue, C₃-C₂₈ cycloalkenyl residue as well as a C₆-C₂₈ aryl residue or C₇-C₂₈ aralkyl residue

and

n denotes a number from 2.5 to 3.5,

wherein said dithiophosphoric acid polysulfide mixture is produced by reacting dithiophosphoric acid disulfides of the formula

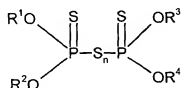


in which

R¹ to R⁴ have the above-stated meaning,

with 0.5 to 1.5 mol of sulfur, optionally in the presence of a solvent, at temperatures of 100 to 140°C.

3. A sulfur donors for the latex vulcanization of natural and synthetic rubber latex comprising dithiophosphoric acid polysulfide mixtures of the formula



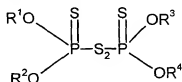
in which

R¹ to R⁴ are identical or different and denote a linear or branched C₁-C₁₈ alkyl residue, C₁-C₁₈ alkenyl residue, C₅-C₂₈ cycloalkyl residue, C₅-C₂₈ cycloalkenyl residue as well as a C₆-C₂₈ aryl residue or C₇-C₂₈ aralkyl residue

and

n denotes a number from 2.5 to 3.5,

wherein said dithiophosphoric acid polysulfide mixture is produced by reacting dithiophosphoric acid disulfides of the formula



in which

R¹ to R⁴ have the above-stated meaning,

with 0.5 to 1.5 mol of sulfur, optionally in the presence of a solvent, at temperatures of 100 to 140°C.

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